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GEOGRAPHY

SOCIO-ECONOMIC CHARACTERISTICS AND PROBLEMS OF SUBURBS: A CASE STUDY OF MADURAI CITY, TAMIL NADU

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Abstract

Rapid urban development and increasing land use changes due to increasing population and economic growth is being witnessed in India and other developing countries. The study area comprises of Madurai City and fringe villages. It extends geographically from 9 ° 50' North latitude to 10° North latitude and between 78 ° 02' East longitude. Primary data pertaining to the study period 2005-06 have been systematically collected. The present study largely depends on the primary sources of information. All information regarding land such as ownership and land use are recorded in the revenue register of village called "Adangals". These are available at Taluk Offices and Village Administrative Offices. 31 questions, 28 variables are generated and these variables are clubbed into the following 5 major groups. 1) Socio-Economic Status of Head of the Family 2) Residential Status 3) Accessibility and Connectivity 4) Infrastructure 5) Major Problems After careful analysis appropriate results were drawn.

Keywords: Sub-urban, Socio-economic characteristics, Problems, Urban expansion, Community

Introduction

With the growth of urbanization, rural areas are constantly being engulfed into urban landscape and villages in the immediate vicinity of cities and towns acquire eventually an urban character. The study of cities is, therefore, incomplete without a proper appraisal of the location, characteristics and development of these peripheral settlements which have a potentiality of urban growth.

The word "suburb" is derived from the old French "sub(b)urbe" and ultimately from the Latin "suburbium", formed from "sub", meaning "under", and "urbs", meaning "city". The first recorded usage, according to the Oxford English Dictionary, comes from Wyclife in 1380, where the form "subarbis" is used.

In the United States and United Kingdom the word "suburb" usually refers to a separate municipality, borough or unincorporated area outside a central town or city.

There is no official definition of a suburb provided by the Bureau of the Census, nor has the term received much systematic attention by sociologists.

One of the pioneering works on suburb was published in 1942 by Wehrwin. Taking the case of Indianapolis he tried to bring out the varied characteristics of suburbs. Outlining the fact that suburban development was mainly due to decentralization of urban population he recognized the change of land use from farm to non-farm ones as the main cause for such decentralization. Such changes

were enhanced by the introduction of car and metalled roads which provided a fast system of mass transportation. Further, these transport lines result in linear expansion of various urban functions along their routes.

Types of Suburbs

Suburbs are of different types according to their functions. The important types are

1) Industrial suburbs 2) Residential suburbs 3) Transportation suburbs 4) Cultural suburbs 5) Resort suburbs.

Suburbs are highly differentiated segments showing much greater specialization in function than that which characterizes the urban unit as a whole. Even though, many types of suburbs are recognized, the most common suburbs are 1) Residential suburb and 2) Industrial suburb.

Wehrwin concentrated more on the nature of the residential growth in suburbs. Due to the development of transport system between city center and suburbs urban areas expanded quickly in American cities. Speculators and land developers rushed to suburbs to buy large areas of agricultural land which they left vacant initially and would sell gradually at a higher price. Therefore in addition to the areas of built up land in the suburbs, there are speculated land which are kept vacant purposely.

In Western cities there has been more congestion, overcrowding and pollution at the city-centre leading to an outmigration of richer section of population which, in

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turn, is responsible for the growth of suburbs. This was accentuated with the growth of per capita income, transportation and communication, introduction of car and need for more private space per person. In India also sometimes richer population out migrated to the suburb for want of more personal space and peaceful environment. However, the studies in North America, Western Europe and Australia do not appear to be totally applicable to the Indian context. In Indian suburbs, new suburban residents consist of the people from various parts of the city and not just from the core area. Here two-step migration is noticeable. In the first stage, immigration of people from different parts of the state and the country takes place to the various parts of the city. Then in the second stage, most of these people, along with some people from the core-city, migrate to suburbs by building own houses or getting house at cheaper rent. In short, the process of suburbanization is not direct; people change their residence a couple of times before they settle down in the suburb in the form of housing colonies. In the suburbs of Indian cities, land located nearer to the city limit and transportation routes has more demand due to accessibility.

The change in the suburban landscape is two-fold:

1. change in structure and
2. change in behaviour of residents

The change in the type of pattern of housing structure of the new suburban residents is seen along with the traditional houses of the original residents in core villages, around which suburbs have developed. The land use of suburbs also gets changed from purely rural, agricultural to partly non-agricultural, urban-oriented one. The transitional nature of suburbs is also reflected in the life-style and behaviour of residents, i.e. in terms of occupation, interaction, material possession and attitude of residents of this region. Due to the presence of urban population in new suburban area, the life style of dual nature is seen among residents. The new suburban population has modern household items compared to those of traditional type in core villages. Infrastructural facilities of suburbs is also transitional in nature with new residential houses having sewage system, water tap, electricity etc. while core villages in suburbs have neither any sewage systems nor any water tap in most of the cases. There is also much difference in demographic composition of core villages and new suburban areas. The residential structure of core villages is caste oriented with relatively low income and education but the residential structure of new suburban areas is mainly class (income) oriented with higher level of socio- economic status.

Aims and Objectives

The following are the main aims and objectives of the present study:

1. To analyse the socio-economic characteristics of the suburbs
2. To identify the role of transport, if any, in the direction of urban expansion
3. To understand the problems of the residential suburbs.

Review of literature

Sengupta (1986) demarcates the suburban zone with reference to residential suburbs of Ahmedabad. She uses some variables for demarcation of the residential suburbs. These are 1) distance of core villages of the maujas from the nearest municipal boundary through motarable road, 2) distance of nearest mauja boundary from the core city of Ahmedabad through motorable road, 3) number of registered housing societies, 4) number of Ahmedabd municipal Transport Service bus routes, 5) scheduled total frequency of all bus routes, 6) percentage of growth of population, 7) density of population per square kilometre and 8) percentage of non-agricultural worker to total workers. The urban and moderately urban suburbs are considered for the demarcation of the residential suburb from the four type of suburbs delimited with the help of the 'Suburbanisation Index'.

Massey and Denton (1988) examined trends in suburbanization for Blacks, Hispanics and Asians from 1970-1980 in 59 US metropolitan areas and considers the effect of suburbanization on segregation. Their segregation in central cities is generally moderate and in suburbs it varies from low to moderate.

Loop (1990) analysed the impact of urban residence on employment for the poor in the case of the construction. He outlined that suburbanization is taking place even in the medium sized cities such as Salem in India. Congestion in the inner city leads an increasing number of middle and high income households to leave it and settle in the newly developing suburbs.

Morries (1994) analysed the fringe districts of Chicago that were settled by factory workers at the beginning of the century. The settlement of the districts depended on decentralization of industry and on opportunities for unregulated home ownership.

Borchert (1996) seeks to identify and define the residential city suburb. He tried to trace the internal organization of a typical city suburb and suggested the significance of city suburbs for metropolitan landscape.

Adams et al (1996) studied patterns of metropolitan suburbanization for 51 large metropolitan areas. The analysis indicates that suburban population growth attributed to in-migration from outside the metropolitan areas is substantially greater on average than that attributed to city to suburb migration.

Articles and books which were published mainly based on the studies in North America and other

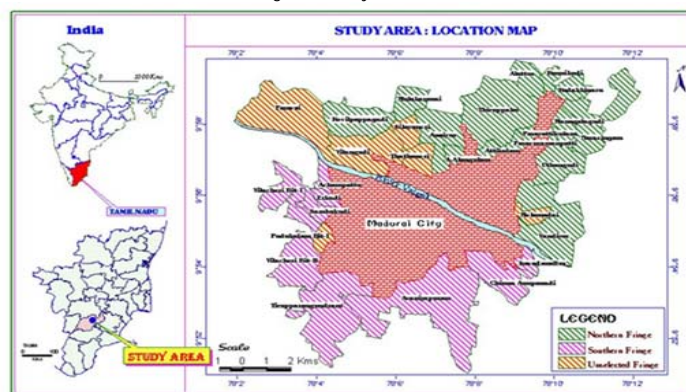
western countries do not appear to be totally applicable in the Indian context. Suburbs of Indian cities, unlike western countries have grown without much infrastructural or residential facility. In India, sometimes suburbs are studied as a part of the whole metropolitan area.

A number of articles have also been reported in newspapers bringing out the miseries of suburban population especially during periods of natural calamities like torrential rains and cyclones. The problem of drainage and unplanned construction has been explicitly analysed (The Hindu, 2006).

Study Area

The study area comprises of Madurai City and fringe villages. It extends geographically from 90° 50' North latitude to 10° North latitude and between 78° 02' East longitude and 78° 12' East longitude. This city is the third largest city in Tamil Nadu in terms of population. It is located at a distance of about 500 km from Chennai. Madurai city and the fringe villages have spread on either sides of River Vaigai. The River Vaigai is the prominent physical feature which divides the study area into two halves.

Fig 3.1. Study area



In the present study only 10 fringe suburbs have taken which are 1) Pandian Nagar. 2) Anaiyur Housing Board. 3) Poriyalur Nagar. 4) E.B. Colony. 5) Lake Area. 6) T.M. Nagar. 7) Muta Colony. 8) Amaithi Poonsolai Nagar. 9) Alwar Nagar. 10) Vadivel Nagar.

The study area is mostly covered by black and red soils. The banks of River Vaigai are covered with sandy soil. In the northern part red and brown soil are dominant. Temperature ranges from 29°C - 38°C and average annual rainfall is 90 cms. Madurai city has good transport and communication facilities. The study area comprises the following National High ways: (1) National Highway 7-connecting Dindigul to Tirunelveli via Madurai. (2) National Highway 49-connecting Rameswaram to Ernakulam via Madurai, (3) National Highway 45B-connecting Madurai with Tiruchirapalli.

Data sets and methodology

Primary data

Primary data regarding the infrastructure and problems of residential suburbs were collected through the questionnaire. There are many residential suburbs in the Madurai fringe areas. Out of 23 fringe areas, five have been chosen for detailed investigation. Of these, three are on the northern fringe and two on the southern fringe. Accessibility and the rate of conversion of agricultural land use to non agricultural use form the basis for the selection of these sample areas. Even

here many residential colonies are found. Among them 10 residential suburbs were selected and 270 sample houses were questioned with random systematic sampling method. Of these 10 residential suburbs 5 residential suburbs are located near the road and the remaining 5 residential suburbs are located away from the road. A pre-tested field questionnaire has been formulated, covering the following aspects to get the primary data.

1. General information regarding the head of the family like age, sex, religion, caste, level of education, occupation, family status and monthly income etc.

2. Housing characteristics, like number of rooms, floor space of the house, own/rent House.

3. Migration pattern and reason for migration

4. Infrastructure facilities like sources of drinking water, availability of drinking water, method of solid waste disposal and reuse of waste.

5. Major problems like water, electricity, street light, road, drainage and zoonoses Problems.

The primary data thus generated is analysed using statistical tools and based on these conclusions are drawn and recommendations are made.

Sample

There are 31 major questions have been framed in the pre-tested questionnaires module. These were primarily coined with a main focus on the residential

status of the population, quality of life style and environmental aspects of the residential suburbs. From these 31 questions, 28 variables are generated and these variables are clubbed into the following 5 major groups.

1) Socio-Economic Status of Head of the Family 2) Residential Status 3) Accessibility and Connectivity 4) Infrastructure 5) Major Problems. The variables in each group are:

I. Socio-economic status of head of the family

Age structure of the family head, Religion, Caste, Level of Education, Occupation, Income, Family status and, Size of the family.

II. Residential status

House ownership status, Domicile status, Migration pattern, Reason for migration, Floor space of the house and, Number of rooms

III Accessibility and connectivity

Main reason for commuting to city and Frequency of commuting

IV. Infrastructure

Sources of drinking water, Availability of drinking water, Method of solid waste disposal and Reuse of waste

Techniques used

In the present study the primary data were converted into table form and to analysed with simple statistical techniques.

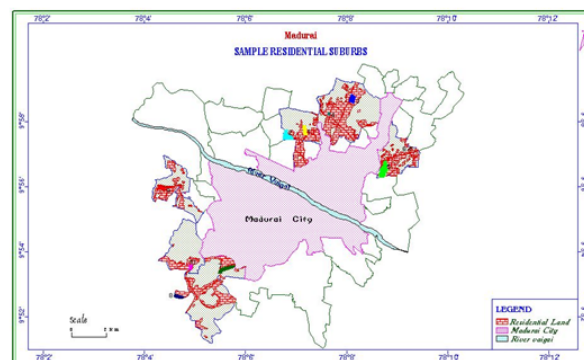
Method

Village maps with survey boundaries have been procured from the Revenue department and the land use maps are generated using the data from village adangal as well as Survey of India Toposheets. The physical aspects of the study area especially the landform conditions and water bodies have been generated from Survey of India Toposheets.

A total 5 sample settlements are chosen for detailed analysis. In the northern fringe, 3 sample settlements are chosen. They are 1) Anaiyur, 2) Thiruppalai and 3) Uthangudi. Of these Uthangudi is located on a National Highway, Thiruppalai is located on a State Highway while Anaiyur is located on a district/other road.

In the case of southern fringe, land use changes are not much in many of the peripheral settlements. Hence only 2 sample settlements have been chosen where there is a comparatively considerable change in residential land use. Both these are located along the National Highway. The samples chosen are Tirupparangundram and Vilacheri.

Figure 5.2 shows suburbs in the sample villages of northern and southern fringes



Results and Discussion

(A) Socio-Economic characteristics

i) Socio-Economic Status of Head of the Family

On an average about 19% of the total sample respondents are of 35-45 years age group. A higher concentration is noticed in Anaiyur Housing Board (33%) and T.M. Nagar (33%) in the northern suburbs. On the other hand the southern suburbs have a lower share (15%) than the total sample households. Even here Amaithi Poonsolai Nagar has a higher share of 30%. Alwar nagar (3%) has the least share.

On an average about 11% of the sample respondents are Christians. Even here the northern suburbs have a slightly higher share (13%) than the southern suburbs. More concentration of Christians occurs in Anaiyur Housing Board (17%), Poriyalar Nagar (17%) in the north and Alwar Nagar (17%) in the south. Least number of Christians occurs in Vadivel Nagar (5%).

Muslims constitute only 7% of the respondents. A higher concentration is noticed in Lake Area (20%) in the north and Alwar Nagar (10%) in the south.

On the whole sample forward community accounts for a share of 19%. However the significance of FC varies from northern suburb (21%) to southern suburb (15%). Out of the six northern residential suburbs Pandian Nagar (47%) and Poriayar Nagar (23%) have a higher share of the FC while Anaiyur Housing board (7%) has the lowest share. On the other hand in the southern suburbs, Alwar Nagar (23%) has the maximum share of FC while Vadivel Nagar (5%) has the least share.

A relatively higher concentration of SC population is found in Anaiyur Housing Board (7%) and E.B. Colony (7%) in the northern suburbs

On the whole, the southern suburbs have a higher percentage of degree holders than their northern counterpart. Even here this category is particularly more dominant in Muta colony (70%) and Amaithi Poonsolar Nagar (70%). In the case of Muta Colony the high share is because the College Teachers' Association purchased the land and constructed their houses. Vadivel Nagar (25%) has the least share in this category. In general respondents with Degree level education account for about 45 to 55% share in the northern suburbs with T.M.Nagar being the exception (70%).

A relatively higher concentration of Technical/Professionals is found only in certain residential suburbs. Pandian Nagar (17%) in the northern suburb and Muta Colony (17%) in the southern suburb have a higher proportion of Technical/Professionals.

Very high income group has a relatively higher share in the southern suburbs (21%) than the northern suburbs (14%). A notable presence of this group is observed only in Lake Area (50%), while the lowest share is found in Pandian Nagar (3%) and Anaiyur Housing Board (3%). On the other hand, among the southern suburbs, Muta Colony has the highest share (46%) in this group of income while it is absent in Vadivel Nagar.

It could be observed that in all residential sample suburbs, nucleus family (65%) out numbers joint family. Medium size family constitutes 29% of the total respondents. A higher concentration is noticed in T.M. Nagar (40%) in the north and Alwar Nagar (40%) in the south. Anaiyur Housing Board (13%) has the least share of this group of family size.

ii) Residential status

On an average, about 70% of the total sample respondents live in their own houses whereas 30% of the respondents live in rented house. Out of the total sample households, 45% of the respondents live in the suburbs for less than five years while another one-third live for more than ten years. The remaining respondents had a domicile status of five to ten years.

The city to suburb migration in general is higher in the northern suburbs (67%) than the southern suburbs (47%). It is particularly higher in Lake Area (97%) and Poriayar Nagar (80%). In the south Muta Colony (80%) has the highest share and Amaithi Poonsolai Nagar (10%) accounts for the least share, in this category. In general, migration from outskirts to suburb and other places to suburb are comparatively less significant.

Two-thirds of the respondents support this fact. In northern suburbs this motive is stronger (70%) than the southern suburbs (53%). Lake area, Amaithi Poonsolai Nagar and Poriayar Nagar suburbs provide strong validation to own a house. On the other hand, Vadivel Nagar and Anaiyur Housing Board suburbs have more respondents who migrate due to the nearness to work spot.

Nearly 70% of the total respondents are live in ground floor houses. On the other hand 25% of the households live in first floor houses while the minimum share of people live in multistoried building. Four to six rooms houses shows the highest share in northern suburb (42%) than the southern suburb (40%). In the southern suburb, less than 4 rooms have an increased share (55%).

iii) Accessibility and connectivity status

From the analysis of whole population sample, people commute to the city mainly for employment (70%) while service (11%) has the least share. On an average, about 83% of the total sample respondents commute to city daily and 10% of the respondents are commuting to city once/twice per week. Only 7% of the respondents are commuting to city occasionally.

In all the residential suburbs, more than 75% of the respondents commute daily to the city proving that the residential development is clearly due to urban influence. *iv)*

iv) Infrastructure

Water supply, Drainage and Waste Disposal are some of the essential infrastructural facilities that are required for residential suburbs. The status of these facilities also decides the rate of growth of the suburbs

(B) Problems of Sub-urban

Respondents have been asked to list out the major problems that they face in their colonies. Based upon the response of all respondents, six major categories of problems have been identified. They are 1) Water, 2) Drainage, 3) Zoonoses, 4) Electricity, 5) Street light and 6) Road. However, it should be noted that the magnitude of these problems vary from one suburb to the other. A brief outline is given below about this varied magnitude of major problems.

i) Water

Water is a basic necessity for human life. It is used for varied household purposes as well as for

drinking. Provision of potable water is a major task for any local administration. Conditions with regard to drinking water has already been explained (see also page No.180 and 181). Here, the availability of water is considered as a problem. In the present case, the older sample residential suburb report a higher incidence of water scarcity compared to other sample residential suburbs.

Water problem is mainly found in Alwar Nagar (50%) in the south and the Anaiyur Housing Board (33%) and the E. B. Colony (27%) in the northern suburbs.

ii) Drainage

In the residential suburbs drainage is poor. Underground drainage is available in core city only. In the suburbs, there is only open drainage. In many cases even this is not present and people drain water on roads and streets. Stagnation of such water becomes the seed beds for many diseases. The stagnant water also creates zoonose problems. It may be noted that drainage is the most ubiquitous problem reported by more than 90% of respondents in all the sample suburbs.

iii) Zoonoses

Poor drainage often leads to the problem of zoonoses. Since drainage water is left in the open either inside the house or on the road, the unsanitary condition creates the zoonoses problems like mosquitoes, flies, rats and even sometimes snakes. Outbreak of diseases results due to such zoonose problems. Since all residential suburbs have poor drainage here also more than 90% of the respondents consider zoonoses as a major problem in the suburb.

iv) Electricity

In general distribution of electricity is better in city areas and poor in rural areas. Since suburbs develop in the rural urban fringe, the electricity distribution is comparatively poor. One of the most common problems faced here is the voltage fluctuation. Further, in terms of shortage of electricity production, power cut is imposed. Yet another reason for fluctuation in electricity supply is the construction of new houses. Correspondingly additional transformers are not put up. These entire combine together to make distribution of electricity as another major problem in the sample suburbs.

However, it may be noted that there are differences in the magnitude of this problem among sample suburb. Anaiyur Housing Board (33%) in the northern suburbs and Vadivel Nagar (50%) and Alwar Nagar (40%) in the southern suburbs have the highest share of respondents who consider electricity as a major problem. On the other hand, since the residents are working in electricity board, the E.B. Colony

respondents do not consider this as a problem. In other suburbs also this is considered as less significant problems.

v) Street Light

Another related problem is the provision of street lights. Since many suburbs develop in rural setting, street light are inadequate. Further the maintenance of street lights is to be done by local administration. Paucity of funds becomes a constraint here. Non provision and improper maintenance of street lights make security in the suburbs to be unsafe leading to incidence of robbery and other crimes.

Among the sample suburbs, Vadivel Nagar (75%) in the south and Anaiyur Housing Board (67%), T.M. Nagar (65%) and Pandina Nagar (60%) in the north face this problem more while it is almost nil in Poriyal Nagar and E.B. Colony.

vi) Road

Yet another major problem faced by suburbs is the condition of road. It should be noted that most of the suburbs develop in areas formerly devoted for agriculture. When plots are made, no pucca roads are built in many cases. Except in a few cases, the land is between plots is left as road without any topping. Local bodies have to lay roads only from the funds generated through tax. In many cases the amount of tax collected is very low. Hence even metalling is not done. During rainy season, these roads become slush making movement of people and vehicles difficult. Metalled and surfaced roads are laid only in phases. Therefore older residential suburbs may have a comparatively better road facility than the newer ones. In the present investigation, this problem is more acute in Vadivel Nagar and T.M. Nagar. It is surprising to note the even in Alwar Nagar which is the oldest suburb, two-thirds of the respondents have indicated roads as a major problem. This may be because of poor maintenance. A similar situation of poor road maintenance is also observed in Anaiyur Housing Board.

To sum up, it is imperative that drainage, zoonoses, road and water supply are the dominant problems in the suburbs.

Conclusion

To identify the socio-economic characteristics and problems of the above suburbs, no secondary data is available. Hence primary data was generated through questionnaires.

More than one-third of the total respondents in the northern suburbs belong to 45-55 years age group. Even here, Lake Area had the maximum share (50%) followed by Anaiyur Housing Board and Pandian Nagar. In the southern suburbs this category occupies 31% which is less than the sample average. Vadivel Nagar

has the maximum share of 45% and the minimum share is seen in Amaithi Poonsolai Nagar.

The less than 35 years age group has relatively higher share in the southern suburbs than the northern suburb. Muta Colony occupies the highest share of 43% and it ranks first followed by Amaithi Poonsolai Nagar. Vadivel Nagar has the least share of this group. In the northern suburbs this age group is less significant. A notable presence of this group is noticed only in E.B. Colony (17%) while this group is totally absent in Pandian Nagar.

Hindus account for more than 70% share while Muslims have the lowest share (7%). On an average about 11% of the sample respondents are Christians.

Caste are categorized into four groups like Forward Community, Backward Community, Most Backward Community and Scheduled Caste.

On the whole sample forward community accounts for a share of 19% and the significance of FC varies from northern suburb to southern suburb. A relatively higher concentration of SC population is found in Anaiyur Housing Board and E.B. Colony in the northern suburbs.

More than 50% of the respondents are Degree holders while about 20% of them had completed only High school level education. Household heads who had technical/professional qualification have a share of about 16% and this category ranks third. Only 10% of the respondents had a level of education below middle school level.

Among the sample households middle income group ranks first with a share of 34% while the very high income group had the least share (17%). High income group and low income groups rank second and third respectively.

Family status can be grouped into two namely, Joint family system and Nucleus Family system. In all residential sample suburbs nucleus family (65%) outnumbers joint family. Nucleus family group has relatively higher share in the southern suburbs than the northern suburbs.

Out of the total sample households small size family occupies for a higher share of 60% while large size family members (11%) have least share. Medium size of the family occupies the second rank.

Better occupation, higher educational level and a comparatively higher income of the respondents indicate that, *"In general most of the suburban residents belong to middle class"*.

On an average, about 70% of the total sample respondents live in their own houses whereas 30% of the respondents live in rented house. Even here, the northern suburbs have a slightly higher share than the southern suburbs.

Out of the total sample households, 45% of the respondents live in the suburbs for less than five years while another one-third live for more than ten years.

The remaining respondents had a domicile status of five to ten years.

The city to suburb migration in general is higher in the northern suburbs (67%) than the southern suburbs (47%). It is particularly higher in Lake Area (97%) and Poriyalar Nagar (80%). In the south Muta Colony (80%) has the highest share and Amaithi Poonsolai Nagar (10%) accounts for the least share in this category. *Thus the "Residential suburbs have population who have mostly migrated from the city"*.

Two primary reasons for migration to suburb may be recognized: 1) To own a house and 2) Nearness to work spot. From the sample survey it is inferred that owning a house is the primary motive for people to migrate to suburb. Two-thirds of the respondents support this fact. In northern suburb this motive is stronger than the southern suburbs. *Thus the ownership of a house is a determinant factor for suburban growth*.

Nearly 70% of the total respondents live in ground floor houses. On the other hand, 25% of the households live in first floor houses while the minimum share of people live in multistoried building. As a whole, less than 4 rooms category ranks first with a share of 48% while the more than 6 rooms group has the least share (12%). The whole residential sample, people commute to the city mainly for employment (70%) while service (11%) has the least share.

On an average, about 83% of the total sample respondents commute to city daily and 10% of the respondents are commuting to city once/twice per week. Only 7% of the respondents are commuting to city occasionally.

Sources of drinking water is grouped into four namely, 1) Bore wells, 2) Hand pumps, 3) Public taps and 4) House tap connection. With the share of 42% bore well is the chief source for drinking water in the sample suburb while hand pumps has the least share. Bore well is the only source for Lake Area, T.M. Nagar and Amaithi Poonsolai Nagar.

Nearly half of the sample respondents dispose their solid waste in vacant open land near the house. Higher concentration of this method of solid waste disposal is noticed in T.M. Nagar, Anaiyur Housing Board and Vadivel Nagar while the least concentration is seen in Poriyalar Nagar (3%) and E.B. Colony (3%).

Some of the respondents reuse solid waste either for fuel or manure. Poriyalar Nagar and Lake Area in the north and Alwar Nagar in the south have more number of respondents who reuse solid waste.

Lack of infrastructural facilities, improper maintenance of available infrastructure, improper method of solid waste disposal and improper drainage facilities in these suburbs also create health disorders and respondents face some problems. Based upon the response of all respondents, six major categories of problems have been identified. They are: 1) water,

2) Drainage, 3) Zoonoses, 4) Electricity, 5) Street light and 6) Road.

Water problem is mainly found in Alwar Nagar in the south and the Anaiyur Housing Board and the E.B. Colony in the northern suburbs.

In the residential suburbs drainage is poor and there is only open drainage. Stagnation of water becomes the seed beds for many diseases. The stagnant water also creates zoonose problems. Drainage and zoonoses problem are the most ubiquitous problem reported by more than 90% of respondents in all the sample suburbs.

Another related problem is the provision of street lights. Since many suburbs develop in rural setting, street light are inadequate. Among the sample suburbs, Vadivel Nagar in the south and Anaiyur Housing Board, T.M. Nagar and Pandian Nagar in the north face this problem more while it is almost nil in Poriyalar Nagar and E.B. Colony

Major findings

1. *Better occupation, higher educational level and a comparatively higher of the respondents indicate that, "In general most of the suburban residents belong to middle class".*

2. *Thus the "Residential suburbs have population who have mostly migrated from the city".*

3. *The ownership of a house in a determinant factor for suburban growth.*

4. *The problems of drainage, zoonoses, road and water supply are the dominant problems in the suburbs.*

Recommendations

The following recommendation may reduce the problem of suburbs and can make living in a suburbs peaceful and enjoyable

1). In order to understand the mechanism of suburban growth, it becomes necessary to elicit the complex relationship that exists among the numerous characters. This is possible only with the help of advanced statistical computation in which these characters are considered variables.

2). It is suggested that steps have to be taken to mitigate these problems even at the formation stage of the suburbs itself.

3). At present, when a new residential suburb is to be established, the approval of layout is mandatory. At this stage itself, it can be made compulsory to tackle the problem of road and drainage.

4). Once drainage problem is checked, zoonoses will become minimum. As it is not difficult to implement.

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